CURRENT STATUS OF COMPOSITE ACTIVITIES IN MALAYSIA

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Introduction

Composite by definition is a broad area which includes any heterogeneous system with many forms of both the matrix and the dispersed phases. However, here in the discussion of composite activities, the current status, we will confined to those commonly referred as Fibre Reinforced Plastics (FRP)). The history of FRP in Malaysia is quite old, however most of them are SMIs utilising mainly basic or traditional techniques viz. hand-layup, bag vacuum.... ; the technologies/knowhow acquired through working experiences abroad and through trial and error, hence still labour intensive. In short, they are low demand with high cost coupled with relatively old technologies and with minimum supportive research and development.

However, the scenario might change particularly with the emerging interest and awareness, boosted further by the backing and the desire to achieve the industrialized nation by the year 2020. Perhaps with the establishment of the national working committee on composite comprising of both private and public sectors, the objective to enhance the composite knowhow and capability will be attained in the near future.

Here, a brief overview of the composite activities viz. both manufacturing and research, the problems/ issues related, the solutions and efforts to overcome the various shortcomings will be reviewed. Hopefully this account will enable strategies to be planned in the context of Austral Asian region.

Manufacturing

As mentioned earlier, most manufacturing activities are SMIs, using old fabrication and tooling methods, hence serving mostly the local needs, albeit some are able to export to third world market. Raw materials and most tooling requirements are imported. As a consequence, the working environment is unconducive without proper safety regulations etc., hence labour shortages are common, particularly with competition from other industries. Also, since composite manufacturing of quality products involves complex design and skill requirements, the supply of such people locally is still poor, with no training institute for such purposes exist now.

However the last two years or so, some changes have taken placed, particularly with the big players coming into play. For example through the establishment of CTC or Composite Tech. City in Melaka, an integrated composite manufacturing environment including research and testing laboratories are being planned. At present a few manufacturing activities such as a hockey stick production is operational. In future, other activities that involve advance techniques are being planned including manufacture of aircraft/automotive components.

Further, there is now a company that produces FRP gratings for offshore platforms, in which as claimed one third are exported to Indonesia. It also manufactures pipes, tanks, trays etc. employing techniques such as Filament Winding, pultrusion and hand-layup. Another company, a joint venture with foreign partner to produce leisure boat for both local and export market.

In short, the composite manufacturing activities are still small with poor infrastructure, with minimum R&D and still facing problems of acquiring/retaining skilled labour, albeit some advanced tooling and manufacturing are procured mainly through joint-ventures and procurement of oversea technologies.

Research Activities

The research activities are plenty, mostly being pursued by government research institutes and the various universities. However, with little demand and resources, the latter mainly via government grant, the IRPA, their activities are rather global in nature, hence have minimum or direct benefits to the local industries. However the situation could be easily tailored in the future if awareness and opportunities for interaction are available.

Some of activities are as follow:-

1) Universiti Sains Malaysia

Research at the School of Industrial Technology is centred mainly on the current world trend i.e thermoplastic based system, particularly the long fibre. A prototype impregnation system has been developed for this, which enables good quality and controllable prepreg and the subsequent composite to be produced. Also, as a supporting activity a Filament Winding System has also been developed.

In view of waste disposal problem of thermoset composite system, extensive research on them are pursued, with some success in which applying a proprietary approach they are easily converted to TP composites. In fact the technique has been successfully extended to other wastes viz. lignocellulosic, glass, paper, sand etc.

Other activities include long term property evaluation of composites under extreme conditions, in which data are still desirable world wide.

2) Other Institutions

SIRIM, Standard Research Institute of Malaysia is currently via their Centre of material and in line with their sole objective of assisting the local industries is looking into kevlar and carbon fibre composites for applications in both automotive and aircraft industries. They are also entrusted together with MPMA to come up with testings and specifications for composite in the country.

Universiti Teknologi Malaysia (UTM) under their Mechanical Department is giving more emphasis on the design and testing of FRP vessels and pipes, solely to overcome the local problems/ needs.

FRIM, Forest Research Institute of Malaysia as the name implies is involved on lignocellulosic based composites, particularly those of palm oil trunk, rubber wood waste etc. as new building material.

Problems/Issues

It is apparent from above, the status of composite activities is small, with lot of problems that needs to be addressed. Amongst them are,

a) Awareness

At present the level of awareness of composite and its potentials and applications are still low, especially among the public. Most do not know even what are really composite or for that matter FRP. You have people going around selling FRP or Fibreglass as anti glaring screen for TV. Even those amongst manufacturer are not aware or following the current or latest developments in tooling, materials etc. Most rely on representatives or sales agents. In short the inefficiency in achieving the desirable standard of composite production is still low.

b) Infrastructure

Infrastructure will include tooling, and material requirements, man-power, knowhow and training, association etc. All these factors are still lagging, as mentioned earlier, they are either procured through working experiences and trial and errors, also relying on a few supplies, hence no control or often are unable to ensure the optimum materials/ formulations/ techniques being employed. However, those which are established via joint-ventures, their activities are of higher quality but they have to conform to the various specifications of the parent company and still lagging in competitiveness and capabilities. Here, to ensure smooth production requirement proper training are usually provided.

At the moment no training or vocational institute that trains manpower are available, unlike the other industries. Hence labour situation is critical coupled with the relatively poor working environment.

Other problems include lack of information and exposure to recent development, lack of support from local and government authorities, or relevant R&D activities.

Establishment of National Working Composite Group

Realizing these shortcomings but the vast the potentials, consolidated and as outlined in the Industrial Master Plan and the Composite Vision, a National Composite Working/ Interest group under MIGHT has been formed this year. Amongst the objective of the MIG are as follow:-

a) acquire composite technology via training, applied research and business activities

b) identify technology and support for Research and Development

c) identify business potentials in advanced composites, particularly in non-aerospace application.

Conclusions

It is clear that composite activities both manufacturing and research are still small, however it is hoped that with proper strategies and regional support, the vision to make composite activities a major role in the future will be realized.

PROGRAM

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HONG KONG
Stay an extra day

Workshop on the Current Status of

COMPOSITE MATERIALS AND THEIR APPLICATION IN THE AUSTRALASIAN REGION

December 8-9, 1994

Composite Building, LG 204 The University of Hong Kong

Sponsored by
a-Geigy (HK) Ltd.
Ina Composite Materials Products Co.Ltd.
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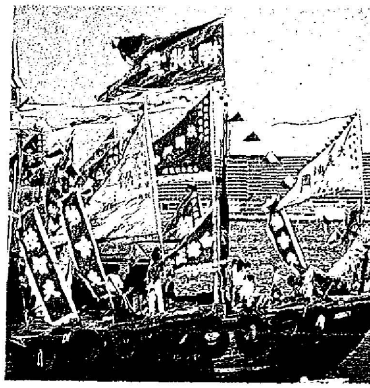
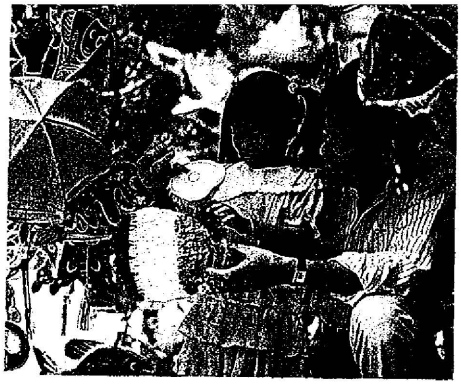
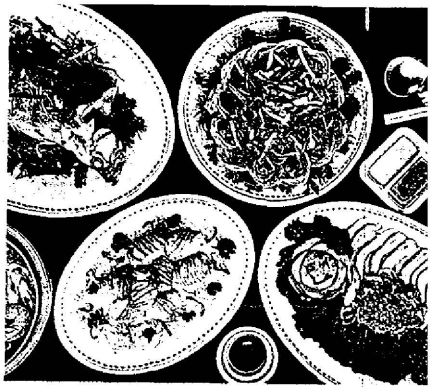
Organised by
Dept. of Mechanical Engineering
The University of Hong Kong
Pokfulam Road ,Hong Kong

Thursday, December 8, 1994



:30	Registration
	INAUGURAL SESSION
:00	Welcome Address : Dr. Anand Asundi Department of Mechanical Engineering, The University of Hong Kong, Hong
:05	Inaugural Address Prof. A.T.W. Chwang, Robert Ho Tung Chair and Head Department of Mechanical Engineering, The University of Hong Kong, Hong
	COMPOSITES AND THEIR APPLICATIONS IN AUSTRALASIA Chairman: Dr.Winston W. Liang
:20	Prof. Frank. K. Ko, Professor and Director of Fibrous Materials Research Ce Drexel University, USA
:40	Prof. Yiu Wing Mai, Professor Mechanical Engineering, University of Science and Technology, Hong Kong
:00	Processing of Metal-Matrix Composites Prof. F.J. Humphreys, Professor and Head Manchester Materials Science Ce University of Manchester and UMIST, UK
:45	Vote of thanks: Dr. R. Gopalan
:00	---------- TEA ----------

TECHNICAL SESSION 1 Chairman: Dr. R.Gopalan

5 Composites in India
Dr. B.R.Somashekar, Head Structures Division
National Aerospace Laboratories, Bangalore, India

5 Composites in China
Prof. Zhao Qusen, Vice of Science and Technical Committee
Beijing Aeronautical and Manufacturing Technical Research Institute, P.R. of C

5 Composites in Hong Kong/China
Mr. Charles Lai, Industrial Promotion Officer
Composites Division, Ciba-Geigy (HK) Ltd., Hong Kong

0 ----------LUNCH----------

TECHNICAL SESSION II Chairman : Dr. W.L. Cheung

0 Composites in Singapore
Dr. Mary B.Chan-Park, Senior Engineer
Polymer Technology Centre, Singapore Institute of Standards and Industrial Rese

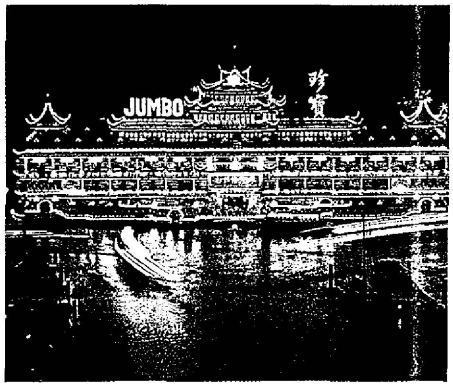
0 Composites in Taiwan
Prof T.Y.Kam, Professor
Dept. of Mechanical Engineering, Natioanl Chiao Tung University, Taiwan

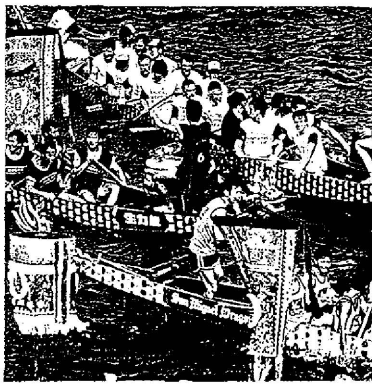
0 Composites in Malaysia
Dr. M.Nasir, Chairman Polymer Technology Divison
School of Industrial Technology, University Sains Malaysia

0 ---------- TEA ----------

0 PANEL DISCUSSION Chairman: Dr. Anand Asundi
Agenda
1. Formation of the AustralAsian Composites Group
2. Creation of Personal and Company Profile Database
3. Creation of a Technology Database
4. Collaborative Programmes among Member Countries
5. Future Activites
6. Any Other Business

Friday, December 9, 1994





Site visit to China Composite Materials Products Co.Ltd in Shenzhen
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The AustralAsian Composites Group

Regional Keypersons

Dr. M.N.Janardhana	Australia
Mr. Jaya Motipalli	Australia
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Prof Gui Yang	P.R.of China
Mr.Lin Shuyi/Mr.Gao J.S.	P.R.of China
Dr. Anand Asundi	Hong Kong
Dr. Winston W. Liang	Hong Kong
Mr. V.Ho/Mr. C.Lai	Hong Kong
Dr. B.R. Somashekar	India
Dr. R.Gopalan	India (HongKong)
Mr. Sreenivasa Setty	India
Mr. V.L.Doshi	India
Dr. T. Ishikawa	Japan
Dr. Young Keun Kim	Korea
Dr. M.Nasir	Malaysia
Ms. Cherly Lim	Malaysia
Dr. D. Bhattacharyya	New Zealand
Dr. C.Y.Yue	Singapore
Prof. T.Y.Kam	Taiwan
Dr. Li-Chung Lee/ Dr. Jong-min Liu	Taiwan

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